SEQUENCE LISTING

```
<110>  Brownlee, George
       Fodor, Ervin
       Palese, Peter
       Garcia-Sastre, Adolfo

<120>  Attenuated Influenza Viruses

<130>  HO-P02074US0/10025165

<140>  US 09/674,892
<141>  1999-05-06

<150>  PCT/GB99/01413
<151>  1999-05-06

<150>  GB 9809666.2
<151>  1998-05-06

<160>  13

<170>  PatentIn version 3.1

<210>  1
<211>  43
<212>  DNA
<213>  ARTIFICIAL SEQUENCE

<220>
<223>  Primer

<400>  1
cggaattcga agacgcagca aaagcaggag tttaaatgaa tcc                         43


<210>  2
<211>  48
<212>  DNA
<213>  ARTIFICIAL SEQUENCE

<220>
<223>  Primer

<400>  2
ccaagcttat taaccctcac taaaagtaga aacaaggagt tttttgaa                    48


<210>  3
<211>  20
<212>  DNA
<213>  ARTIFICIAL SEQUENCE

<220>
<223>  Primer

<400>  3
tggactagtg ggagcatcat                                                   20
```

```
<210>  4
<211>  20
<212>  DNA
<213>  ARTIFICIAL SEQUENCE

<220>
<223>  Primer

<400>  4
gggtgtcctt cgaccaaaac                                                    20


<210>  5
<211>  29
<212>  DNA
<213>  ARTIFICIAL SEQUENCE

<220>
<223>  Primer

<400>  5
gcgcaagctt ctagattttt ttttttttt                                          29


<210>  6
<211>  28
<212>  DNA
<213>  ARTIFICIAL SEQUENCE

<220>
<223>  Primer

<400>  6
gcgcaagctt tattgagatt atatttcc                                           28


<210>  7
<211>  21
<212>  DNA
<213>  ARTIFICIAL SEQUENCE

<220>
<223>  Primer

<400>  7
gtggcaataa ctaatcggtc a                                                  21


<210>  8
<211>  21
<212>  DNA
<213>  ARTIFICIAL SEQUENCE

<220>
<223>  Primer

<400>  8
gggaacaatt aggtcagaag t                                                  21
```

```
<210>   9
<211>   28
<212>   DNA
<213>   ARTIFICIAL SEQUENCE

<220>
<223>   Primer

<400>   9
gcgcaagctt tattgagatt atatttcc                                              28


<210>   10
<211>   24
<212>   DNA
<213>   ARTIFICIAL SEQUENCE

<220>
<223>   Primer

<400>   10
catattgtgt ctgcatctgt agct                                                  24


<210>   11
<211>   29
<212>   DNA
<213>   ARTIFICIAL SEQUENCE

<220>
<223>   Primer

<400>   11
gcgcaagctt ctagattttt ttttttttt                                             29


<210>   12
<211>   28
<212>   DNA
<213>   ARTIFICIAL SEQUENCE

<220>
<223>   Primer

<400>   12
gcgcaagctt tattgagatt atatttcc                                              28


<210>   13
<211>   4074
<212>   DNA
<213>   INFLUENZA

<400>   13
tcttccgctt cctcgctcac tgactcgctg cgctcggtcg ttcggctgcg gcgagcggta    60

tcagctcact caaaggcggt aatacggtta tccacagaat cagggggataa cgcaggaaag   120

aacatgtgag caaaaggcca gcaaaaggcc aggaaccgta aaaaggccgc gttgctggcg   180
```

```
tttttccata ggctccgccc ccctgacgag catcacaaaa atcgacgctc aagtcagagg   240

tggcgaaacc cgacaggact ataaagatac caggcgtttc cccctggaag ctccctcgtg   300

cgctctcctg ttccgaccct gccgcttacc ggatacctgt ccgcctttct cccttcggga   360

agcgtggcgc tttctcatag ctcacgctgt aggtatctca gttcggtgta ggtcgttcgc   420

tccaagctgg gctgtgtgca cgaacccccc gttcagcccg accgctgcgc cttatccggt   480

aactatcgtc ttgagtccaa cccggtaaga cacgacttat cgccactggc agcagccact   540

ggtaacagga ttagcagagc gaggtatgta ggcggtgcta cagagttctt gaagtggtgg   600

cctaactacg gctacactag aaggacagta tttggtatct gcgctctgct gaagccagtt   660

accttcggaa aaagagttgg tagctcttga tccggcaaac aaaccaccgc tggtagcggt   720

ggtttttttg tttgcaagca gcagattacg cgcagaaaaa aaggatctca agaagatcct   780

ttgatctttt ctacggggtc tgacgctcag tggaacgaaa actcacgtta agggattttg   840

gtcatgagat tatcaaaaag gatcttcacc tagatccttt taaattaaaa atgaagtttt   900

aaatcaatct aaagtatata tgagtaaact ggtctgaca gttaccaatg cttaatcagt   960

gaggcaccta tctcagcgat ctgtctattt cgttcatcca tagttgcctg actccccgtc  1020

gtgtagataa ctacgatacg ggagggctta ccatctggcc ccagtgctgc aatgataccg  1080

cgagacccac gctcaccggc tccagattta tcagcaataa accagccagc cggaagggcc  1140

gagcgcagaa gtggtcctgc aactttatcc gcctccatcc agtctattaa ttgttgccgg  1200

gaagctagag taagtagttc gccagttaat agtttgcgca acgttgttgc cattgctaca  1260

ggcatcgtgg tgtcacgctc gtcgtttggt atggcttcat tcagctccgg ttcccaacga  1320

tcaaggcgag ttacatgatc ccccatgttg tgcaaaaaag cggttagctc cttcggtcct  1380

ccgatcgttg tcagaagtaa gttggccgca gtgttatcac tcatggttat ggcagcactg  1440

cataattctc ttactgtcat gccatccgta agatgctttt ctgtgactgg tgagtactca  1500

accaagtcat tctgagaata gtgtatgcgg cgaccgagtt gctcttgccc ggcgtcaata  1560

cgggataata ccgcgccaca tagcagaact ttaaaagtgc tcatcattgg aaaacgttct  1620

tcggggcgaa aactctcaag gatcttaccg ctgttgagat ccagttcgat gtaacccact  1680

cgtgcaccca actgatcttc agcatctttt actttcacca gcgtttctgg gtgagcaaaa  1740

acaggaaggc aaaatgccgc aaaaaaggga ataagggcga cacggaaatg ttgaatactc   1800

atactcttcc tttttcaata ttattgaagc atttatcagg gttattgtct catgagcgga  1860

tacatatttg aatgtattta gaaaaataaa caaataggggg ttccgcgcac atttccccga  1920

aaagtgccac ctgacgtcta agaaaccatt attatcatga cattaaccta taaaaatagg  1980
```

```
cgtatcacga ggcccttttcg tctcgcgcgt ttcggtgatg acggtgaaaa cctctgacac    2040

atgcagctcc cggagacggt cacagcttgt ctgtaagcgg atgccgggag cagacaagcc    2100

cgtcagggcg cgtcagcggg tgttggcggg tgtcggggct ggcttaacta tgcggcatca    2160

gagcagattg tactgagagt gcaccatatg cggtgtgaaa taccgcacag atgcgtaagg    2220

agaaaatacc gcatcaggcg ccattcgcca ttcaggctgc gcaactgttg ggaagggcga    2280

tcggtgcggg cctcttcgct attacgccag ctggcgaaag ggggatgtgc tgcaaggcga    2340

ttaagttggg taacgccagg gttttcccag tcacgacgtt gtaaaacgac ggccagtgaa    2400

ttcgaagacg cagcaaaagc aggagtttaa atgaatccaa accagaaaat aataaccatt    2460

gggtcaatct gtatggtagt cggaataatt agcctaatat tgcaaatagg aaatataatc    2520

tcaatatgga ttagccattc aattcaaacc ggaaatcaaa accatactgg aatatgcaac    2580

caaggcagca ttacctataa agttgttgct gggcaggact caacttcagt gatattaacc    2640

ggcaattcat ctctttgtcc catccgtggg tgggctatac acagcaaaga caatggcata    2700

agaattggtt ccaaaggaga cgtttttgtc ataagagagc cttttatttc atgttctcac    2760

ttggaatgca ggaccttttt tctgactcaa ggcgccttac tgaatgacaa gcattcaagg    2820

gggacctttta aggacagaag cccttatagg gccttaatga gctgccctgt cggtgaagct    2880

ccgtccccgt acaattcaag gtttgaatcg gttgcttggt cagcaagtgc atgtcatgat    2940

ggagtgggct ggctaacaat cggaatttct ggtccagatg atggagcagt ggctgtatta    3000

aaatacaacc gcataataac tgaaaccata aaaagttgga ggaagaatat attgagaaca    3060

caagagtctg aatgtacctg tgtaaatggt tcatgttttta ccataatgac cgatggccca    3120

agtgatgggc tggcctcgta caaaattttc aagatcgaga aggggaaggt tactaaatca    3180

atagagttga atgcacctaa ttctcactac gaggaatgtt cctgttaccc tgataccggc    3240

aaagtgatgt gtgtgtgcag agacaattgg cacggttcga accgaccatg ggtgtccttc    3300

gaccaaaacc tagattataa aataggatac atctgcagtg gggttttcgg tgacaacccg    3360

cgtcccaaag atggaacagg cagctgtggc ccagtgtctg ctgatggagc aaacggagta    3420

aagggatttt catataagta tggcaatggt gtttggatag gaaggactaa aagtgacagt    3480

tccagacatg ggtttgagat gatttgggat cctaatggat ggacagagac tgatagtagg    3540

ttctctatga gacaagatgt tgtggcaata actaatcggt cagggtacag cggaagtttc    3600

gttcaacatc ctgagctaac agggctagac tgtatgaggc cttgcttctg ggttgaatta    3660

atcagggggc tacctgagga ggacgcaatc tggactagtg ggagcatcat ttctttttgt    3720

ggtgtgaata gtgatactgt agattggtct ggccagacg gtgctgagtt gccgttcacc    3780
```

```
attgacaagt agtttgttca aaaaactcct tgtttctact tttagtgagg gttaataagc    3840

ttggcgtaat catggtcata gctgtttcct gtgtgaaatt gttatccgct cacaattcca    3900

cacaacatac gagccggaag cataaagtgt aaagcctggg gtgcctaatg agtgagctaa    3960

ctcacattaa ttgcgttgcg ctcactgccc gctttccagt cgggaaacct gtcgtgccag    4020

ctgcattaat gaatcggcca acgcgcgggg agaggcggtt tgcgtattgg gcgc          4074
```